

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of )  
Susana FERNÁNDEZ ALONSO et al. ) Group Art Unit: Unassigned  
Application No.: Unassigned ) Examiner: Unassigned  
Filed: December 19, 2001 )  
For: Method and Apparatus for )  
Presentation of Calling Subscriber )  
Number in Mobile Networks )

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Before examination of this application, please enter the following amendment.

**IN THE SPECIFICATION**

Page 1, line 4, please replace the section heading with --**BACKGROUND**--.

Page 1, line 19, please delete the section heading "**BACKGROUND OF THE INVENTION**".

Page 6, line 14, please replace the section heading with --**DETAILED DESCRIPTION**--.

Page 16, line 24, please delete the section heading "**DESCRIPTION OF THE INVENTION**".

Page 21, line 26, please delete the section heading "**DESCRIPTION OF EMBODIMENTS OF THE INVENTION**".

**IN THE CLAIMS**

Page 28, line 1, please replace the section heading with the following: --

**WHAT IS CLAIMED IS:--**

Please replace claims 1-25 with new claims 26-50 as follows.

26. **(NEW)** A method of transmitting a calling subscriber number received at a Gateway Mobile Switching Center ("GMSC") of a home Public Land Mobile Network ("PLMN") along with an incoming call towards a destination subscriber who is a roaming subscriber in a visited PLMN and who is one of a called subscriber and a forwarded-to subscriber by interrogating at least one entity selected from GSM network entities, UMTS network entities, and Inter-Working Functions by at least one interrogating operation selected from GSM MAP operations, UMTS MAP operations, and combinations thereof in order to retrieve a routing number and reach the roaming subscriber and set up the call, the method comprising the steps of:

extracting, at an interrogating network entity, the received calling subscriber number identification to be further sent in an interrogating GSM/UMTS MAP operation;

including the extracted calling subscriber number identification in the interrogating GSM/UMTS MAP operation at the interrogating network entity;

forwarding the interrogation and the calling subscriber number identification with the interrogating GSM/UMTS MAP operation to the at least one interrogated entity.

27. **(NEW)** The method of claim 26, wherein an interrogating GSM/UMTS MAP operation for retrieving the routing number as well as to submit the calling subscriber number identification is a MAP operation: "Send Routing Information".

28. **(NEW)** The method of claim 26, wherein an interrogating GSM/UMTS MAP operation for retrieving a routing number as well as to submit the calling subscriber number identification is a MAP operation: "Provide Roaming Number".

29. **(NEW)** The method of claim 26, wherein the home PLMN is one of a GSM network and a UMTS network that include a home GMSC, and the visited

PLMN where the home subscriber is roaming is neither a GSM network nor a UMTS network.

30. **(NEW)** The method of claim 29, wherein the home GMSC interrogates a GSM/UMTS home location register ("HLR") by a MAP operation: "Send Routing Information" that includes the calling subscriber number identification, and the GSM/UMTS HLR interrogates an Inter-Working Function used in intersystem roaming by a MAP operation: "Provide Roaming Number" that also includes the calling subscriber number identification.

31. **(NEW)** The method of claim 26, wherein the visited PLMN where the home subscriber is roaming is one of a GSM network and a UMTS network, and the home PLMN is neither a GSM network nor a UMTS network.

32. **(NEW)** The method of claim 31, wherein an InterWorking Function used in intersystem roaming interrogates a visited mobile switching center/visitor location register ("MSC/VLR") by a MAP operation: "Provide Roaming Number" that includes the calling subscriber number identification.

33. **(NEW)** The method of claim 26, wherein the home PLMN is one of a GSM network and a UMTS network that include a home GMSC, and the visited PLMN where the home subscriber is roaming is also one of a GSM network and a UMTS network.

34. **(NEW)** The method of claim 32, wherein the home GMSC interrogates a GSM/UMTS home location register ("HLR") by a MAP operation: "Send Routing Information" that includes the calling subscriber number identification, and the GSM/UMTS HLR interrogates the MSC/VLR where the subscriber is roaming by a MAP operation: "Provide Roaming Number" that also includes the calling subscriber number identification.

35. **(NEW)** The method of claim 26, wherein the calling subscriber number identification is included as a new parameter of a predetermined type in a MAP operation: "Send Routing Information".

36. **(NEW)** The method of claim 26, wherein the calling subscriber number identification is included in an Extension Container field of a MAP operation: "Send Routing Information".

37. **(NEW)** The method of claim 26, wherein the calling subscriber number identification is included as a new parameter of a predetermined type in a MAP operation: "Provide Roaming Number".

38. **(NEW)** The method of claim 26, wherein the calling subscriber number identification is included in an Extension Container field of a MAP operation: "Provide Roaming Number".

39. **(NEW)** The method of claim 32, wherein any of a GSM and UMTS MSC/VLR store on a per subscriber and per call basis the calling subscriber number identification received in a MAP operation: "Provide Roaming Number" for further delivery to the destination subscriber.

40. **(NEW)** An apparatus for transmission of a calling subscriber number identification received at a home Public Land Mobile Network ("PLMN") or at an InterWorking Function ("IWF"), comprising:

first means for interrogating at least one entity selected from GSM network entities, UMTS network entities, and Inter-Working Functions by at least one interrogating operation selected from GSM MAP operations, UMTS MAP operations, and combinations thereof in order to retrieve a routing number and reach a destination subscriber who is a roaming subscriber roaming in a visited PLMN and set up the call;

second means for extracting the calling subscriber number identification from a previously received signalling message to be further sent in an interrogating operation selected from GSM MAP operations, UMTS MAP operations, and combinations thereof; and

third means for including the calling subscriber number identification extracted by the second means in the interrogating GSM/UMTS MAP operation in order to retrieve a routing number and reach such a roaming subscriber and set up the call, presenting the calling subscriber number identification.

41. **(NEW)** The apparatus of claim 40, further comprising means for storing on a per subscriber and per call basis, at a GSM entity or a UMTS entity, the calling subscriber number identification received in an interrogating GSM/UMTS MAP operation for further delivery to the destination subscriber.

42. **(NEW)** The apparatus of claim 40, wherein the interrogating GSM/UMTS MAP operation is a MAP operation: "Send Routing Information", and the MAP operation includes the calling subscriber number identification.

43. **(NEW)** The apparatus of claim 40, wherein the interrogating GSM/UMTS MAP operation is a MAP operation: "Provide Roaming Number", and the MAP operation includes the calling subscriber number identification.

44. **(NEW)** The apparatus of claim 40, wherein the home PLMN is one of a GSM network and a UMTS network that include a home GMSC; a visited PLMN where the home subscriber is roaming is neither a GSM network nor a UMTS network; the home GMSC interrogates a GSM/UMTS home location register ("HLR") by a MAP operation: "Send Routing Information" that includes the calling subscriber number identification; and the GSM/UMTS HLR interrogates an InterWorking Function used in intersystem roaming by a MAP operation: "Provide Roaming Number" that also includes the calling subscriber number identification.

45. **(NEW)** The apparatus of claim 40, wherein the visited PLMN where the home subscriber is roaming is one of a GSM network and a UMTS network; the home PLMN is neither a GSM network nor a UMTS network; and an Inter-Working Function used in intersystem roaming interrogates a visited mobile switching center/visitor location register ("MSC/VLR") by a MAP operation: "Provide Roaming Number" that includes the calling subscriber number identification.

46. **(NEW)** The apparatus of claim 40, wherein the home PLMN is one of a GSM network and a UMTS network that include a home GMSC; the visited PLMN where the home subscriber is roaming is also one of a GSM network and a UMTS network; the home GMSC interrogates a GSM/UMTS home location register ("HLR") by a MAP operation: "Send Routing Information" that includes the calling subscriber number identification; and the GSM/UMTS HLR interrogates a mobile switching center/visitor location register ("MSC/VLR") where the home subscriber is roaming by a MAP operation: "Provide Roaming Number" that also includes the calling subscriber number identification.

47. **(NEW)** The apparatus of claim 40, wherein the calling subscriber number identification is included as a new parameter of a predetermined type in a

MAP operation: "Send Routing Information".

48. **(NEW)** The apparatus of claim 40, wherein the calling subscriber number identification is included in an Extension Container field of a MAP operation: "Send Routing Information".

49. **(NEW)** The apparatus of claim 40, wherein the calling subscriber number identification is included as a new parameter of a predetermined type in a MAP operation: "Provide Roaming Number".

50. **(NEW)** The apparatus of claim 40, wherein the calling subscriber number identification is included in an Extension Container field of a MAP operation: "Provide Roaming Number".

#### IN THE ABSTRACT

Please replace the Abstract found on Page 1 with the new Abstract attached as a separate sheet.

#### REMARKS

The written description has been amended and the claims and Abstract have been replaced in order to place this application in better form for examination. Favorable consideration is respectfully solicited.

Respectfully submitted,

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**ABSTRACT**

Methods and apparatus for reliable transmission of a calling subscriber number ("A-number") received at a Gateway Mobile Switching Center ("GMSC") of a home Public Land Mobile Network ("PLMN") along with an incoming call towards a roaming destination subscriber are disclosed. A GSM network entity, an UMTS network entity, and/or an Inter-Working Function is selected and interrogated by a GSM and/or UMTS MAP operation to retrieve a routing number, and to further reach the roaming subscriber and set up the call. The interrogation of the entity includes extracting the previously received A-number at the interrogating network entity, including the A-number in the interrogating GSM/UMTS MAP operation at the interrogating network entity, and forwarding the interrogation and the A-number with the interrogating GSM/UMTS MAP operation to the interrogated entity.

**Attachment to Amendment dated December 19, 2001**

**Marked-up Copy of Specification**

**Page 1, line 4,**

[TECHNICAL FIELD OF THE INVENTION] BACKGROUND

**Page 1, line 19,**

[BACKGROUND OF THE INVENTION]

**Page 6, line 14,**

[PRIOR ART TO THE INVENTION] DETAILED DESCRIPTION

**Page 16, line 24,**

[DESCRIPTION OF THE INVENTION]

**Page 21, line 26,**

[DESCRIPTION OF EMBODIMENTS OF THE INVENTION]

**Marked-up Copy of Claims**

**Page 28, line 1,**

[CLAIMS] WHAT IS CLAIMED IS: